

# Risk governance and bank profitability in ASEAN-5: a comparative and empirical study

Risk  
governance  
and bank  
profitability

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## Abstract

**Purpose** – The purpose of this paper is to highlight the disparity between the disclosures of risk governance (RGOV) categories, namely, structures both at the board and management level, and RGOV practices among five of the Association of Southeast Asian Nations (ASEAN5) countries. Furthermore, this paper investigates the effects of RGOV and its categories on return on assets (ROA).

**Design/methodology/approach** – Using 285 ASEAN5 bank-year observations comprising hand-collected data for the period of 2010–2014, RGOV indexes are developed on the basis of 12 of the 13 governance guidelines published by the Basel Committee.

**Findings** – Although some banks are found to be early adopters, there is an increasing trend of disclosure for all of the investigated categories. Furthermore, there are no effects of the overall RGOV, board-level RGOV structure and risk management practice on ROA. However, the effect of the management-level RGOV structure on ROA is negative and significant.

**Research limitations/implications** – Measurements of RGOV indexes are based solely on the examination of criteria that have not been previously tested. Other limitations are related to the information completeness, subjectivity and interpretation.

**Practical implications** – Management-level RGOV tends to decrease profitability because of the additional costs related to its implementation. Financial regulators may find this result useful as feedback to evaluate the effectiveness of regulation and possible future improvements.

**Originality/value** – This paper's uniqueness lies in constructing new RGOV indexes on the basis of the latest bank governance guidelines from the Basel Committee issued on July 9, 2015.

**Keywords** ASEAN, Return on assets, Risk governance structure, Risk management practice

**Paper type** Research paper

## 1. Introduction

The financial crisis experienced by Asian countries during the period of 1997–1998 and the following global crisis have proven banking governance weaknesses to be a major cause of the failure of this industry (Mehran *et al.*, 2011; Zhuang *et al.*, 2000). Weaknesses in governance particularly include management that lacks an understanding of the risks they take and boards that do not pay attention to their risk management function (FSB, 2012; OECD, 2014), oversight of the risk management function through banks' risk governance (RGOV) practices is extremely important, as stressed by the FSB (2012), Basel Committee on Banking Supervision (BCBS, 2015) and OECD (2014). RGOV is a part of corporate governance decisions and actions that serve to ensure the effectiveness of risk management (IFC, 2012).

Accordingly, this study is motivated by the importance of banking RGOV in promoting effective risk management and enhancing stakeholder confidence. RGOV practices in the



banking industry are also a highly important part of standard/general governance for several reasons. First, RGOV is useful for optimal decision making related to risks and maximizes public confidence in risk management processes, structures and decisions (IRGC, 2008). The magnitude of benefits of the RGOV practices has also encouraged some international financial institutions, such as BCBS and FSB, to revise their corporate governance principles by incorporating RGOV (IFC, 2012).

Second, RGOV is a relevant measure of governance for the banking industry; therefore, empirical testing is important (Aebi *et al.*, 2012; Battaglia and Gallo, 2015; Nahar *et al.*, 2016) because banking activities are riskier than non-financial corporate activities (IRGC, 2008). Research conducted by Battaglia and Gallo (2015) demonstrated a positive market assessment of banks that have strong RGOV in the Chinese and Indian capital markets. However, to the best of the researchers' knowledge, research on RGOV using a sample of ASEAN banks is still very limited. Thus, research on the topic of RGOV still needs to be empirically tested.

This study focuses on using the method of scoring to measure the effectiveness of RGOV. In previous studies, the analysis of RGOV was limited to the use of certain proxies. For example, Battaglia and Gallo (2015) analyzed the effect of strong RGOV on banking stock performance in China and India. They used a greater number of the risk committee and how often the risk committee met as a proxy for strong governance. By contrast, the present study uses RGOV scores as a proxy for effective RGOV practices, which are based on the "Guidelines of Corporate Governance Principles for Banks" by BCBS, published on July 9, 2015. These scores have the advantage of being better able to explain overall effective risk banking governance than the proxy used by Battaglia and Gallo (2015).

This study uses 285 firm years of the ASEAN-5 banking, namely, Indonesia, Malaysia, Philippine, Singapore and Thailand over a five-year period to investigate the effect of RGOV practices on bank profitability. This paper considers the issue of endogeneity by ensuring the possibility of an inverse effect on whether performance encourages RGOV practices. The test results show the negative effect of management-level RGOV structures on bank performance. However, there is no impact of the current overall RGOV, board-level RGOV structures and risk management practices on bank current performance. This research also demonstrates the sensitivity analysis to strengthen our empirical argument.

This research is expected to offer some novel contributions to the existing literature. First, it is useful in understanding RGOV structures and risk management practices. Second, it provides an additional methodology by developing RGOV scores on the basis of the "Guidelines of Corporate Governance Principles for Banks" (BCBS, 2015). The calculated scores are intended to explain overall banking RGOV practices, in contrast to the proxy used by previous studies. The study is also expected to highlight policy directions for regulators and standard-setters regarding the importance of RGOV.

The remainder of the paper is organized as follows. Section 2 reviews the relevant prior studies and develops the hypotheses for the present study; Section 3 describes the methodology; Section 4 reports the empirical results; and Section 5 concludes the paper.

## 2. Literature review and hypotheses development

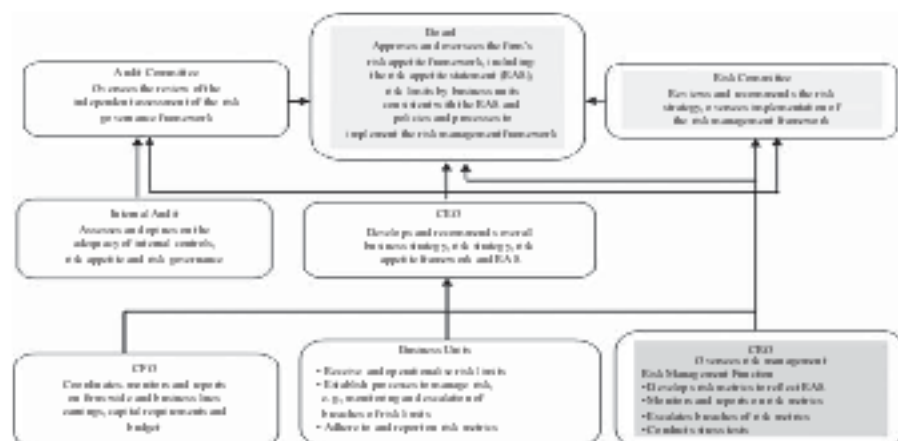
### 2.1 Conceptual framework: risk governance in banking

The monetary crisis that hit the Asian economy toward the end of the 1990s encouraged governance reforms in Asia. Banking regulators and supervisors responded it by issuing provisions regarding bank health. However, the banking industry also needs to enact risk management to address potential risks that may arise. One tool for achieving effective risk management is RGOV, which is a relatively new term and is "the subset of corporate governance decisions and actions that ensure effective risk management, including cohesive policies, guidance, processes and decision-rights within the area of risk" (IFC, 2012).

An effective RGOV framework is essential for determining the adequacy of existing principles, guidelines and governance practices, as shown in the OECD (2014) Committee report on the “Corporate Governance Lessons from the Financial Crisis” of 2009. In addition to the OECD, the FSB accepted the importance of RGOV by issuing a “Thematic Review on Risk Governance.” FSB also encouraged some standard-setting bodies (such as the OECD, International Association of Insurance Supervisors, International Organization of Securities Commissions and BCBS) to review the principles of governance, taking into account sound RGOV practices. The FSB (2013) further provided an RGF that refers to the roles and responsibilities of boards, chief risk officers (CROs) and risk management functions (as shown in Figure 1).

The board of directors (BOD) is in charge of establishing a bank’s risk appetite and risk principles. In performing its duties, the BOD is assisted by the Board Risk Management Committee (BRMC), which oversees a bank’s risk management. Various risk exposures, risk profiles, risk concentrations and trends are regularly reported by the BRMC to the BOD and senior management. The BRMC is supported by a risk management process led by the CRO. This process is undertaken daily and independently assesses credit risk, market risk, operational risk, liquidity risk and other key management risks. The CRO also monitors a bank’s risk profile, reports its activities to the CEO and the board (BRMC and/or BOD), and maintains a direct relationship with the BRMC. Meanwhile, senior management actively manages risk through various risk management committees, such as the credit and liquidity risk management committee. Audit committee or audit committee board (ACB) generally active oversight the independence of internal audits (IAs) and reviews the IA’s function, the scope of the annual audit plan and the frequency of IA activities. The ACB’s meeting minutes, subsequently reported to the BOD and BRMC, are to ensure effective exchange of information related to risk issues.

Guided by the FSB (2013), the BCBS revised the “Principles for Enhancing Corporate Governance” published in October 2010 by issuing the “Corporate Governance Principles for Banks” in July 2015. The new guidelines were explicitly aimed at strengthening board responsibilities in terms of collective and responsibility oversight on risk management, risk culture, risk appetite and their relationship with the bank’s risk capacity. These RGOV guidelines differ from previous guidelines in terms of expanding the BOD’s responsibilities; further defining the elements of a robust RGF, including its relationship



Source: FSB (2013)

Figure 1.  
An example of a  
risk governance  
framework (RGF)

with business unit responsibilities, risk management teams and IAs (called “three lines of defense”); providing guidance for banking supervisors to evaluate the members of the board and senior management; and reviewing appropriate risk-based compensation structures and strengthening sound risk culture.

RGOV guidelines offer 13 principles that banks must implement and adjust to the size, complexity, structure, economic significance, risk profile, business model and bank group (if any). These guidelines mainly discuss the responsibilities, qualifications and composition of the board; the responsibilities of senior management; the governance of the group structure; the risk communication undertaken by the bank to create a strong risk culture; the roles and responsibilities of the compliance and audit functions; compensation; the disclosure and transparency of banking organization governance; and the supervisor roles.

### *2.2 Overall risk governance and bank performance*

In practice, a number of major US banks have sought to adopt RGOV since 2011. Several subsequent surveys have revealed the influence of risk-related governance on banking performance during the global crisis (2007–2008), for example, those conducted by Ellul and Yerramilli (2013), Aebi *et al.* (2012) and Srinivas *et al.* (2015). The profitability of US banks is influenced by independent risk management (Ellul and Yerramilli, 2013), and banks’ stock returns are influenced by their RGOV structures (Aebi *et al.*, 2012). In addition, banks where the CRO directly reports to the board have better equity and higher stock returns compared with banks where the CRO reports to executive management.

Some research has been conducted on RGOV in Asia, such as the study by Battaglia and Gallo (2015), who analyzed whether RGOV levels (with the number of risk committee and frequency of risk committee meetings as proxies) related to better banking performance in China and India. The result of the observation period of 2007–2011 (crisis period) showed that risk committee size was positively related to return on equity (ROE) and return on assets (ROA), whereas the number of risk committee meetings is positively correlated with the market valuation. Similarly, Nahar *et al.* (2016) used the crisis period (2006–2012) and proved that RGOV was positively related to the performance of Bangladesh listed banks.

In contrast to previous studies, this study uses a RGOV index to measure banking RGOV to investigate the possible positive impact of RGOV on bank performance (ROA). In accordance with agency theory, which suggests that corporate RGOV can be one mechanism that helps solve agency problems and offers monitoring tools regarding how banks manage risks, RGOV can convince principals (investors) that the funds invested in the bank concerned will be well managed, which will increase investment demand, bank growth and bank stock prices. In other words, banks with effective RGOV tend to perform well. Thus, the first hypothesis formulated for this study is as follows:

*H1. Overall RGOV practices have a positive effect on banks’ ROA.*

Aebi *et al.* (2012) proved that share value was related positively to the frequency of meetings of risk committee but negatively to the number of committee members. Hence, simply having a risk committee did not seem to be beneficial for the bank’s performance. However, having a more dedicated committee that meets more frequently seemed to positively affect the bank’s performance. In general, empirical explanation of the relationship between outside board and bank’s performance has been mixed and inconclusive. On the one hand, there was a negative relationship (or no relationship) between them based on managerial hegemony theory (see Erlens *et al.*, 2012; Pathan and Faff, 2013; Adams and Mehran, 2012). On the other hand, there was a positive effect of the independent board on bank’s performance due to reducing agency cost (Choi and Hasan, 2005).

This study uses the aforementioned novel index of board-level RGOV structures to measure the responsibilities, independence and competence of board members and examine

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board selection, audit committee, risk committee and compensation committee members. Furthermore, this research investigates whether these RGOV structures have positive impact on bank performance based on agency theory. The second hypothesis formulated for this research is as follows:

*H2. Board-level RGOV structures have a positive effect on banks' ROA.*

The banking industry often requires a careful analysis of its risk management function due to its high leverage and high-risk characteristics (Zulkafli and Semad, 2007). The functions of senior risk management under the direction of the CRO, compliance and audit in carrying out the tasks must be independent of the operational work unit. According to Elul and Yerramilli (2013), a good RGOV structure, strong and independent CRO acts as a proxy, is able to reduce loans and risk of non-performing loans and increase the share price of US large banks during the 2007–2008 credit crisis.

Furthermore, risk management functions led by the CRO must be coordinated to carry out their compliance function. The compliance function addresses compliance risks and monitors bank operations in accordance with applicable laws, regulations and internal policies (BCBS, 2015, para 136). The bank's responsibility to comply with risk management regulations through its compliance function is beneficial in terms of creating competitive advantage and earning good reputation from customers, investors and rating agencies. The tasks of compliance function are more preventive (*ex ante*), whereas the *ex post* tasks are undertaken as part of the IA function. People carrying out this IA function should have expertise in assessing the effectiveness and efficiency of internal controls, risk management, RGOV systems and risk processes. Minton *et al* (2011) find that the non-executive director's financial expertise level is positively related to risk-taking and bank stock performance.

In accordance with the above explanation, RGOV structures at management level are expected to decrease bank risks that affect the bank's value. These structures support senior-management tasks by considering risk aspects (risk appetite), independent CRO, as well as independence and skills of the compliance and IA functions. Thus, the third hypothesis is as follows:

*H3. Management-level RGOV structures have a positive effect on banks' ROA.*

Financial institutions are required to establish a risk management structure to meet the regulatory requirements in terms of RGOV. Their policies are expected to communicate the details on internal RGOV that can drive better business performance (BCBS, 2015). Agency theory supports the importance of RGOV in response to divergence between shareholder and management interest. Shareholders and managers may have different interests in terms of corporate objectives and risk management. Shareholders may prefer investments with low risk and return, whereas management prefers high-risk investment and high returns. Thus, agency theory emphasizes the need for RGOV to align the interests of managers with those of shareholders and contribute to the company's financial performance. Aebi *et al* (2012), for example, suggest that risk management practices (which are proxied with the direct reports from the CRO to CEO or board) can boost a bank's ROE and stock returns.

In relation to the risk management practices in the form of compensation provisions, the US and Europe banks and financial institutions were required to eliminate compensation practices that encourage excessive risk-taking in 2010, which was a response of the tumultuous financial markets to the issuance of risk-based compensation regulations. Furthermore, the Basel Committee issued risk-based compensation guidelines in 2015 as part of its guidelines on bank RGOV. An appropriate compensation structure is expected to encourage managers to act in the interests of the company and shareholders. Based on some of these arguments, the fourth hypothesis is as follows:

*H4. Risk management practices have a positive effect on banks' ROA.*

### 3. Methodology

#### 3.1 Sample selection and data sources

This research sample was selected using a purposive sampling method and 285 fiscal report of commercial banks listed in ASEAN, i.e., those of Indonesia, Malaysia, Philippines, Singapore and Thailand. The sample size comprised 57 banks including 29 Indonesian banks, 8 Malaysian banks, 9 Philippine banks, 3 Singaporean banks and 8 Thai banks. These countries initiated the establishment of ASEAN and have instituted the best disclosure practices (Gray *et al.*, 2014), as well as showed a significant economic growth rate and its member nations are the main players of the ASEAN Economic Community (EAC) based on competitiveness (Schwab, 2015). Information on the disclosure of RGOV variables for analytical purposes was hand-collected from annual reports. Banks ROA and other control variables were obtained from annual financial statements (2010–2014), and stock market data were taken from the BankScope database published by Bureau van Dijk.

#### 3.2 Research design and regression model

This research used content analysis in developing an RGOV index to measure the disclosure of RGOV. The validity and reliability tests were done to measure RGOV index using a Cronbach's  $\alpha$  value 0.60–0.70 as "good" or "adequate" (Clark and Watson, 1995).

The following multivariate regression models were developed to test the effect of RGOV practices on profitability:

- Model 1: effect of RGOV practices on bank profitability:

$$ROA_{it} = \alpha_0 + \alpha_1 RGOV_{it} + \alpha_2 \ln SIZE_{it} + \alpha_3 CAR_{it} + \alpha_4 LAW_{it} + \alpha_5 \ln GDP_{it} + \epsilon_{it}$$

Research hypothesis can be presented in the form of statistics as: Hip1:  $\alpha_1 > 0$ ; and expectations for control variables are:  $\alpha_2 > 0$ ;  $\alpha_3 \neq 0$ ;  $\alpha_4 > 0$ ;  $\alpha_5 \neq 0$ .

- Model 2: effect of RGOV practices by category on bank profitability:

$$ROA_{it} = \gamma_0 + \gamma_1 STRBOARD_{it} + \gamma_2 STRMGT_{it} + \gamma_3 PRACTRM_{it} \\ + \gamma_4 \ln SIZE_{it} + \gamma_5 CAR_{it} + \gamma_6 LAW_{it} + \gamma_7 \ln GDP_{it} + \epsilon_{it}$$

Research hypothesis can be presented in the form of statistics as: Hip2:  $\gamma_1 > 0$ ; Hip3:  $\gamma_2 > 0$ ; Hip4:  $\gamma_3 > 0$ ; and expectations for control variables are:  $\gamma_4 > 0$ ;  $\gamma_5 \neq 0$ ;  $\gamma_6 > 0$ ;  $\gamma_7 \neq 0$ .

Table I presents the definitions and sources of all variables in the empirical analysis.

#### 3.3 Risk governance index (RGOV)

This study used a self-constructed RGOV indexes to measure the scores of RGOV disclosures for each bank-year ( $RGOV_{it}$ ). These indexes were essentially based on governance guidelines issued by BCBS (2015), which comprises 13 principles: the board's responsibilities, the board's qualifications and compositions, the board's own structure and practices, the roles of senior management (CEO), governance of group structure, risk management function, compliance function, IA function, compensation, disclosure and transparency and the roles of the supervisor. The first 12 of these principles were chosen while the 13th principle was omitted due to an external RGOV process. In other words, this study focused more on how the responsibilities of the board (board of commissioners (BOC)), directors and management affect RGOV.

This research builds indicators that can assess the extent to which ASEAN-5 banks apply risk management by including a number of regional governance guidelines as follows:

- (1) Regulation of the Financial Services Authority (POJK) concerning the implementation of risk management and good corporate governance for banking (18/POJK.03/2016,

Variables	Measurements	Predictions	Measurement scales
<i>Dependent variable</i>			
ROA (ratio)	ROA = Net Income/Total Assets		BankScope
<i>Independent variables</i>			
RGOV (index)	Score or index of risk governance, developed from the guidelines of risk governance issued by BCBS (2015)	+	Annual report
STRBOARD	Score of risk governance structure: board level, developed from guidelines of risk governance issued by BCBS (2015)	+	Annual report
STRMGT	Score of risk governance structure: management level, developed from guidelines of risk governance issued by BCBS (2015)	+	Annual report
PRACTRM	Score of risk management practices, developed from guidelines of risk governance issued by BCBS (2015)	+	Annual report
<i>Control variables</i>			
lnSIZE	Natural logarithm of total assets (in US\$ million)	+	BankScope
CAR	CAR = (Tier One Capital + Tier Two Capital)/Risk Weighted Assets	+/-	Annual report
LAW	Effect of country law, dummy variable, 1 = common law, 0 = non-common law (code law and mixed law)	+	Central Intelligence Agency
lnGDP	Natural logarithm of real GDP per capita (US\$)	+/-	World Bank

**Table I.**  
Research variables,  
measurements,  
predictions and  
data sources

27/POJK.03/2016, 55/POJK.03/2016, 8/POJK.04/2015, 45/POJK.03/2015) and Bank Indonesia Regulation (PBI) No. 11/19/PBI/2009 concerning the risk management certification for management and officers of Indonesia commercial banks.

- (2) BNM/RH/PD 029-9 regarding the corporate governance issued in August 2016, and BNM/RH/GL013-5 effective March 2013 regarding the RGOV by Bank Negara Malaysia (BNM).
- (3) Guidelines on corporate governance for financial holding companies, banks, direct insurers, reinsurers and captive insurers incorporated in Singapore issued by the Monetary Authority of Singapore in April 2013, and the RGOV Guidance for Listed Boards issued by Corporate Governance Council, Singapore.
- (4) Principles of good corporate governance for listed companies 2012 issued by Stock Exchange of Thailand.
- (5) Philippine corporate governance blueprint 2015 issued by the Securities and Exchange Commission, Philippines.

The index of RGOV practices in this study produced 17 criteria or items grouped into three criteria, specifically RGOV structure-board level, RGOV structure-management level and risk management practices. Scoring on these items were based on three levels, namely, low (Score 1), medium (Score 2) and high (Score 3). Figure 2 explains the framework of RGOV indexes using several steps.



**Figure 2.**  
Framework of risk  
governance indexes

Different roles and responsibilities of board systems between countries that have one-tier and two-tier systems were also considered in this study. The quality of RGOV practices was assessed by the total score for each bank (Barth *et al.*, 2007; Dedu and Chitan, 2013); the higher the score, the more effective are the bank's RGOV practices (Table II).

### 3.4 Control variables

This study used the natural logarithm (ln) of total assets (in millions of US\$) to avoid extreme values and data abnormalities that could arise because the total assets value of each bank was quite large. Furthermore, Basel II guidelines require banks to maintain an adequate capital adequacy ratio (CAR). If the bank's CAR value is below the minimum set (below 8 percent), it must be careful in giving credit, which could potentially lower bank earnings. A higher CAR value indicates a bank's ability to finance operational activities, which substantially contributes to profitability.

To control for the impact of different regulatory systems, this research used the origin of the legal system on the basis of a dummy variable, which is common law vs civil law.

#### Evaluation criteria

##### A. Risk governance structure: board level (Principles 1–3) – STRBOARD

1. Are board's responsibilities (BOC) disclosed taking into account the risk aspect?
2. Are the board members (BOC) independent, as measured by the number of independent boards (commissioners)  $\geq 50\%$ ; do they have risk management competencies, as measured by at least one member of BOC having a risk management certificate or risk management experience?
3. Does the selection process of board candidates (BOC) assess financial independence and competence; the record of integrity and good reputation; and whether there is enough time to carry out the responsibility?
4. Is the audit committee independent, as measured by the number of independent audit committee members  $\geq 50\%$ ; does it comprise at least one person who has expertise in finance or accounting?
5. Is the risk committee independent, as measured by the number of independent risk committee members  $\geq 50\%$ ; does it have expertise in banking risk management, as measured by at least one risk committee member with a risk management certificate?
6. Is the compensation committee independent, as measured by the number of independent remuneration committee members  $\geq 50\%$ ; does it evaluate the remuneration taking into account the risks?

##### B. Risk governance structure: management level (Principles 4, 6, 9, 10) – STRMGT

7. Do the tasks of senior management in managing bank activities take into account the risk aspect (risk appetite)?
8. Is there an independent CRO (risk management committee) of other executive functions?
9. Is the compliance function independent of the operational work unit; does it provide reports on compliance risks?
10. Is the internal audit function independent of the operational work unit; a professional member of the auditor or have an internal auditor certification; and does it have risk-related activity skills, as measured by a risk management certificate?

##### C. Risk management practices (Principles 5–8, 11) – PRACTRM

11. Does the risk management framework cover the entire banking entity (integrated)?
12. Does the CRO (Risk Management Committee/Risk Director) report a risk profile directly to the board (Board Risk Committee or BOC)?
13. Does the board risk committee or senior management evaluate the risks faced by the bank and all risk profiles on a regular basis?
14. Is the risk-related information communicated to the risk committee board and senior management?
15. Does the reporting system of the risk profile contain important and routine information?
16. Does the remuneration structure consider risk-based compensation in evaluating the manager's (senior executive) performance?
17. Is the governance disclosure delivered to stakeholders through websites and annual reports?

**Sources:** BCBS (2015) and ASEAN5 guidelines of bank governance

**Table II.**  
Governance index for assessing risk governance practices (RGOV): risk governance structures and risk management practice



Ultimately, a natural logarithm (ln) of real gross domestic product (GDP) per capita (in US\$) was used as country level-variable control to control the cyclical output effect, which is expected to have either a positive or negative effect on bank profitability.

### 3.5 Endogeneity issues

This study also did not ignore the endogeneity issue as a common issue and serious problem in governance studies related to the conclusion of the research results. According to Hermalin and Weisbach (2003), board structure depends on the company's past performance. However, this association is likely to be false because the corporate governance structure and performance are determined endogenously. We argue that this problem did not occur in our study for two reasons. First, panel estimation can potentially ameliorate the bias arising from unobservable heterogeneity. Second, Wintoki *et al.* (2012) also stated that research needs to consider "dynamic endogeneity" to avoid bias problems. The term "dynamic endogeneity" explains how the company's current performance affects future performance and governance. However, dynamic endogeneity is less problematic because the bank's past performance does not affect RGOV practices, for which the size and composition of the board serve as proxies (Adams and Mehran, 2012), as well as the number of risk committees and existence of a risk management unit (Nahar *et al.*, 2016).

## 4. Results

### 4.1 Risk governance disclosure variable (RGOV)

Table III presents the validity test using a significance level of 5 percent with r-table 0.113 (285 observations).

Item	Category	r-hit	Min.	Max.	Mean	Low	%	Medium	%	High	%
<i>A. Risk governance structure: board level (STRBOARD)</i>											
1	Responsibilities of board members (BOC)	0.407 <sup>a</sup>	1	3	2.65	4	18.40	75	26.32	206	72.28
2	Independence and competence of board members	0.487 <sup>a</sup>	1	3	2.70	30	10.53	61	21.40	194	68.07
3	Selection process of board member candidates	0.586 <sup>a</sup>	1	3	2.03	26	9.12	230	80.70	29	10.18
4	Audit committee	0.412 <sup>a</sup>	1	3	2.86	6	2.11	29	10.18	250	87.72
5	Risk committee	0.365 <sup>a</sup>	1	3	2.75	29	10.18	80	28.07	176	61.75
6	Compensation committee	0.563 <sup>a</sup>	1	3	1.98	45	15.79	202	70.88	38	13.33
<i>B. Risk governance structure: management level (STRMGT)</i>											
7	Senior management	0.389 <sup>a</sup>	1	3	2.04	126	44.21	21	7.37	138	48.42
8	Chief risk officer (CRO)	0.382 <sup>a</sup>	1	3	2.40	2	0.70	196	58.25	117	41.05
9	Compliance function	0.385 <sup>a</sup>	1	3	2.28	42	14.74	122	42.81	121	42.46
10	Internal audit function	0.492 <sup>a</sup>	1	3	2.28	13	4.56	180	63.16	92	32.28
<i>C. Risk management practices (PRACTRM)</i>											
11	Integrated risk governance	0.500 <sup>a</sup>	1	3	2.23	71	24.90	78	27.37	136	47.72
12	CRO's reporting	0.385 <sup>a</sup>	1	3	2.29	68	23.86	66	23.16	151	52.98
13	Risk evaluation by board and senior management	0.105	1	3	2.25	11	3.86	191	67.02	83	29.12
14	Risk meeting (board and senior management)	0.313 <sup>a</sup>	1	3	2.46	12	4.21	129	45.26	144	50.53
15	Risk information	0.383 <sup>a</sup>	1	3	2.81	10	3.51	34	11.93	241	84.56
16	Risk-based performance	0.457 <sup>a</sup>	1	3	2.06	13	4.56	180	63.16	92	32.28
17	Publication	na	3	3	3	0	0	0	0	2	100

Note: <sup>a</sup>Valid value, valid (r-count > r-table), not valid (r-count < r-table)

**Table III.**  
Results of validity  
and distribution  
observation of  
RGOV items

This study excludes items not having the valid values, and the result of the reliability test shows that the coefficient value of Cronbach's  $\alpha$  is 0.665. The lowest average value for the disclosure of RGOV structures (board and management levels) is 1.98, specifically for the independence and responsibility categories of the compensation committee in evaluating remuneration for the BOC and their committees by considering the risk aspect. This result is mainly attributable to the fact that the majority of banks, that is, approximately 71 percent (70.88 percent), do not consider the risk when evaluating remuneration, which is particularly true for banks in Indonesia because consideration of risk was only required by the Financial Services Authority of Indonesia (OJK) starting in 2015.

The highest average values of RGOV structures at the board level (STRBOARD) and management level (STRMGT) are found in the independence and competence category of audit committee members, with a value of 2.86, which reflects the fact that the majority (88 percent) of the samples disclosed the number of independent audit committee members exceeding 50 percent of all samples and that at the least one of them had experience in accounting or financial practices. Indonesian banks largely disclose these criteria as compliance with the disclosure requirements required by regulators (OJK). Panin Bank, for example, discloses the complete criteria related to independence and experience for the accounting or finance field during 2010–2014:

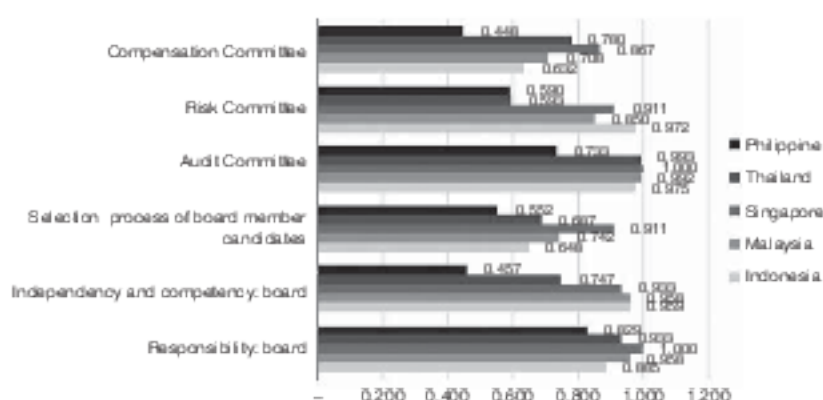
In line with BI regulation, the Audit Committee membership carries the following criteria: The Audit Committee consists of at least 1 (one) Independent Commissioner as Chairman, 1 (one) Independent Party with expertise in finance or accounting and 1 (one) Independent Party with expertise in law or banking [...] [...] an independent party of at least 51% of the total members. (Panin, 2014, p. 185)

The highest average value of the disclosure of RGOV practices (PRACTRM) is found in the risk communication category as 2.81. The lowest average value is the provision of compensation on the basis of risk-based performance that consistent with the average results of the sixth item. The survey results show that only 32 percent of bank samples disclose these criteria. However, banks are more likely to disclose their remuneration structure without considering the risk (approximately 63 percent), and the remaining ones do not disclose anything related to senior-management remuneration. Only two Indonesia samples, CIMB Niaga and Bank Central Asia, reveal the remuneration structure for senior management (directors) based on risk-based performance, whereas all the Singaporean banks disclose this information. The following passage from the DBS bank's annual report reveals the remuneration structure taking into account risks for more than two consecutive years:

The balance between fixed and variable elements of total compensation changes according to performance, rank and function. This is in line with the FSB principle of ensuring that employee incentives remain focused on prudent risk-taking and effective control, depending on the employee's role [...]. It is aimed at incentivising employees whose decisions can have a material impact on DBS to adopt appropriate risk behaviours. These employees include senior management, key personnel at business units and senior control staff. (DBS, 2014, p. 80)

Figure 3 describes the index average of RGOV structures disclosure at the board level (STRBOARD). The disclosure level of the STRBOARD is quite high (40–100 percent). Overall, Singaporean banks have the highest disclosure level in all the categories except the independence and competence of board and risk committee categories. This is followed by Malaysian, Thai and Indonesian banks, primarily in terms of the independence and competence of boards and audit committees as well as board responsibilities. By contrast, Philippine banks have a very low disclosure of STRBOARD for all categories.

In accordance with ADB (2014), the Singapore listed companies have the highest scores in terms of "Responsibilities of the Board" due to the company making improvements in



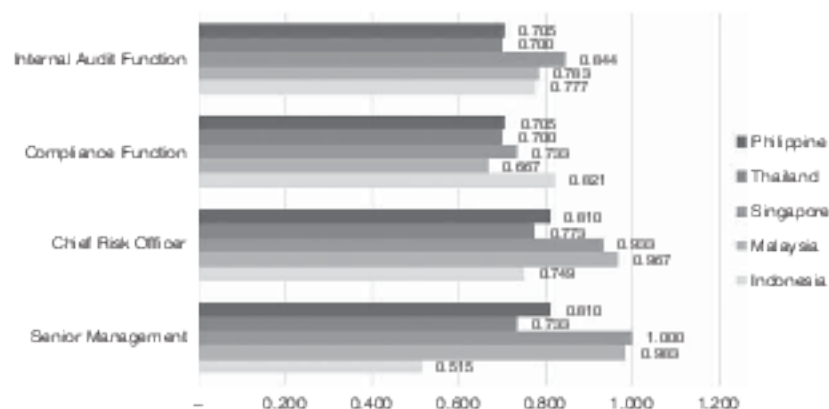
Source: Annual report and notes to the financial statements of each bank in ASEAN-5 are analyzed

Figure 3.  
A comparison of the board-level risk governance structure among ASEAN-5 banks

terms of board responsibilities in accordance with corporate governance guidelines (effective in 2012). The results of the ADB survey also show that there is an increased board obligation to review the adequacy of internal control and risk management systems so that it has a better risk-based risk management and compensation plan item.

Figure 4 depicts the average index of RGOV structure disclosure at the management level (STRMGT) during 2010–2014. The STRMGT disclosure rate in these countries is better than the STRBOARD disclosure rate, which is 50–100 percent. Singaporean banks show the highest rate in terms of disclosure in almost all categories except for the existence and independence of the CRO, which is slightly lower than that of Malaysian banks.

Indonesian banks reveal more the practice of independence and composition of compliance functions. In accordance with the ADB (2014) survey, several Indonesia listed companies have quality annual reporting due to compliance with corporate governance guidelines. However, Indonesian banks have the lowest rate in terms of explicitly declaring the responsibilities of senior management and independence of the CRO.



Source: Annual report and notes to the financial statements of each bank in ASEAN-5 are analyzed

Figure 4.  
A comparison of the management-level risk governance structure among ASEAN-5 banks

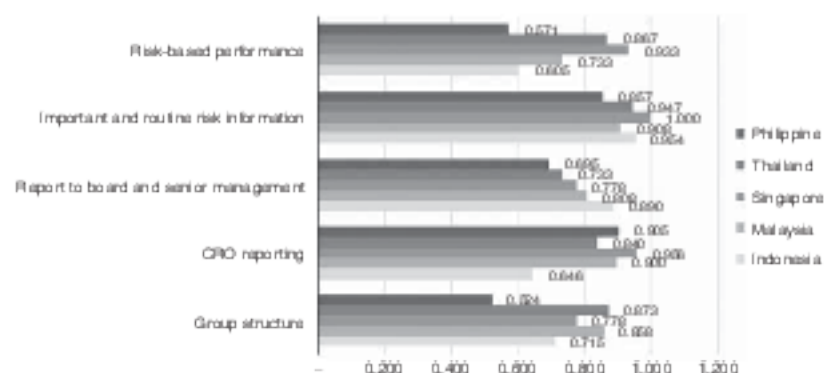
Furthermore, Thai banks have an average STRMGT rate disclosure slightly lower than that of Philippine banks for all categories.

In general, the average disclosure rate of RGOV practices (PRACTRM) among Philippines banks is the lowest compared with banks in the four other ASEAN countries. However, the profile report by a CRO to the board of Philippine banks is quite high, approximately 90 percent, which is slightly less than that of Singaporean banks. Figure 5 also indicates that Indonesian banks are superior in terms of the level of risk disclosure submitted by the management to the board and senior management.

By contrast, Thai banks are superior in disclosing the integrated governance, being slightly above Malaysian banks. Consistent with the ADB (2014) survey, most Thai listed companies disclose in detail related party transactions and corporate group structure in the annual report suggesting the company is aware of material issues and risks that may affect the bank and its subsidiaries.

Based on the calculation of the RGOV index per year, the quality of RGOV disclosures exhibits an upward trend throughout the observation period. Although the level of RGOV disclosure in Philippine banks is the lowest, the trend of this practice shows the fastest increase during 2010–2014.

Table IV illustrates that the highest level of RGOV disclosure over five years occurred in Singaporean banks, followed by banks in Malaysia, Thailand and Indonesia, with the lowest level occurring in Philippine banks. The high level of transparency associated with RGOV in the Singapore and Malaysia banks that reflects the existence of specific guidance on RGOV



**Figure 5.**  
Comparison of  
risk management  
practices among  
ASEAN-5 banks

Source: Annual report and notes to the financial statements of each bank in ASEAN-5 are analyzed

**Table IV.**  
Average index of risk  
governance practices  
(RGOV) of banks in  
ASEAN-5 (2010–2014)

Country	Average RGOV index					Average/country
	2010	2011	2012	2013	2014	
Indonesia	0.742	0.765	0.784	0.802	0.821	0.783
Malaysia	0.817	0.844	0.817	0.878	0.886	0.854
Singapore	0.852	0.904	0.901	0.911	0.948	0.905
Thailand	0.724	0.793	0.807	0.818	0.824	0.793
Philippines	0.600	0.641	0.676	0.721	0.759	0.679
Average/year	0.738	0.773	0.790	0.811	0.830	0.788

Source: Annual report and notes to the financial statements of each bank in ASEAN-5 are analyzed

issued by financial institution regulators in those countries. The Corporate Governance Council in Singapore issued the "Risk Governance Guidance for Listed Boards" in May 2012, and the BNM (Malaysia) issued "Risk Governance" guidelines in March 2013. These RGOV guidelines encourage listed banks to disclose board responsibilities related to RGOV as required. In addition, in accordance with ADB, the ranking results during 2011–2014 show that Singaporean companies have the highest score in terms of "Disclosure and Transparency" and "Responsibilities of the Board," followed by companies in Malaysia, Thailand, the Philippines and Indonesia.

#### 4.2 Multivariate analysis

This study uses feasible generalized least squares (FGLS) estimators with the results of collinearity shown in Table V.

Table V indicates that ROA is significantly and positively correlated with bank size (SIZE) and the size of capital or CAR. However, overall RGOV practices (RGOV), RGOV structures at the board level (STRBOARD) and management level (STRMGT) and risk management practices (PRACTRM) are not found to be correlated with ROA. Legal system variables (LAW) and country growth (GDP) are also not correlated with ROA.

The next step is testing the models using panel data. This study uses two research models that cannot be tested by fixed-effect methods because of the near-singular matrix. A near-singular matrix is thought to occur because the data LAW and GDP continuously remain during the observation period, which can cause an error. Finally, after testing the Lagrange Multiplier, the estimation method used is a common effect model or pooled least square with FGLS/Seemingly Uncorrelated Regression (SUR). FGLS/SUR is used if the structure of the variance matrix and its residual covariance is assumed to be heteroskedastic and if there is a cross-section correlation. Thus, the implications of autocorrelation and heteroskedasticities on panel data can be corrected by the SUR cross-section model. A SUR model with the FGLS method can also give an error value (error), but this is smaller than that in a regression model with OLS method, if there is autocorrelation. Table VI provides the estimation results of the two research models.

4.2.1 *Analysis of the effect of risk governance practices on ROA.* Based on Table VI, the coefficient of *H1* is insignificant and negative (with  $-0.004$  at  $p = 0.168$ ), which means that the RGOV structure does not affect bank performance. This finding is consistent with the study of Love and Rachinsky (2015) and Falattah and Dickins (2012). There are three

Corr. Prob	ROA	RGOV	STRBOARD	STRMGT	PRACTRM	LN(SIZE)	CAR	LAW
	-0.002							
	-0.047	0.730***						
	0.062	0.701***	0.240***					
	0.002	0.757***	0.294***	0.382***				
	0.290***	0.449***	0.205***	0.431***	0.366***			
	0.129**	-0.144**	-0.069	-0.094	-0.157***	-0.138**		
	-0.062	0.441***	0.321***	0.389***	0.285***	0.517***	-0.120**	
	-0.072	0.543***	0.453***	0.343***	0.385***	0.595***	-0.067	0.822***

**Notes:** ROA, return on assets, is the level of bank performance in managing company's assets. RGOV is the effective risk governance practice. STRBOARD is the board-level risk governance structure. STRMGT is the management-level risk governance structure. PRACTRM is the risk management practice. LN(SIZE) is the bank size. CAR is the capital adequacy ratio. LAW is the legal system of each country. GDP is the real gross domestic product per capita. \*\* and \*\*\* indicate significance at 5 and 1 percent of levels, respectively.

**Source:** Results of data processing

**Table V.**  
Collinearity test  
between research  
variables

Independent variable	Prediction	Coefficient (1)	Dependent variable: ROA		
			Prob <i>t</i> -stat.	Coefficient (2)	Prob <i>t</i> -stat.
RGOV	H1: +	-0.004	0.188		
STRBOARD	H2: +			0.004	0.116
STRMGT	H3: +			-0.006	0.005***
PRACTRM	H4: +			-0.001	0.798
lnSIZE	+	1.002	0.000***	1.003	0.000***
CAR	+/-	0.047	0.000***	0.050	0.000***
LAW	+	-0.001	0.347	0.001	0.809
lnGDP	+/-	0.996	0.000***	0.996	0.000
<i>n</i>		285		285	
Adjusted <i>R</i> <sup>2</sup>		0.485		0.494	
<i>F</i> -stat.		54.42	0.000***	40.58	0.000***

**Notes:** ROA, return on assets, is the level of bank performance in managing company's assets. RGOV is an effective risk governance practice, including 17 criteria or items of risk governance practices constructed from guidelines of risk governance issued by BCBS (2015). STRBOARD is the board-level risk governance structure, including the responsibilities, independence and competence of the board; selection process of board member and all committee candidate (audit, risk and compensation). STRMGT is the management-level risk governance structure that includes the roles of senior management as well as the tasks and independence of the CRO, compliance and internal audit functions. PRACTRM is the risk management practice, including the group structure, CRO reporting, reporting process from the risk management function to the board and senior management, important and routine risk information and risk-based performance. lnSIZE is the bank size or a natural logarithm of the total assets. CAR is the capital adequacy ratio. LAW is a dummy variable of the legal system of each country. lnGDP is the natural logarithm of the real gross domestic product per capita. \*\*\*Indicate significance at 1 percent of level, respectively

**Table VI.**  
Regression estimation  
results from  
testing H1-H4

arguments to explain the results of this study. First, there is a possibility of lag time, so current RGOV disclosures do not directly affect the current ROA. Therefore, this study conducts additional testing by investigating the impact of the previous period RGOV practices on current ROA. This new model is called the distributed-lag-model. Second, Singapore banking observation may be one of the factors because they have different characteristics from the observations of the four other countries in terms of the advanced stock markets, value of GDP per capita and total assets above average. According to Claessens and Laeven (2004), these characteristics can affect profitability. For this reason, this research conducted robustness testing by omitting Singapore banking observations.

Finally, the RGOV index includes several attributes or aspects of RGOV. In some cases, governance characteristics can be a substitute for other attributes. In other cases, they can complement each other (Fakattah and Dickins, 2012). For example, ROA is influenced by risk management structures and the CEO reports directly to the board (Aebi *et al.*, 2012), independent risk management (Elul and Yerramilli, 2013) and the size of the risk committee (Battaglia and Gallo, 2015). Conversely, companies with better RGOV (for which equity-based compensation for CEOs serves as a proxy) are costly (Fahlenbrach and Stulz, 2011), and independent boards and boards having financial expertise reduce bank performance (Erkens *et al.*, 2012; Minton *et al.*, 2011).

**4.2.2 Analysis of the effect of board-level risk governance structure on ROA.** Table VI indicates that H2 has an insignificant and positive coefficient (with 0.004 at  $p = 0.116$ ), which means that board-level RGOV structure does not affect banks' ROA. In other words, board responsibilities, the independence and competencies of the board and audit, risk and compensation committees, and the selection process of board member candidates have very limited ability to explain the ROA. Consistent with previous finding (Arouri *et al.*, 2011; Elamer and Benyazid, 2018), boards generally fail to be responsible for monitoring risk management. Board of Independent Commissioners, despite being an important element

of RGOV, cannot fully undertake supervision. The existence of an Independent BOC within a company tends to be a mere formality to demonstrate compliance with existing regulations. Consistent with the ADB survey; the ineffectiveness of supervision by the Independent BOC can be traced to strong control by company founders and majority ownership (Nam and Nam, 2005; Choi and Hasan, 2006). This finding is also supported by data that 70 percent of Indonesia banks are owned by families so they are very vulnerable to expropriation of minority shareholders. Similarly, ASEAN and Asia banking are generally characterized by significant state or family ownerships and fragmented banking structures (Pasiouras and Gaganis, 2007; Zulkaffli and Samad, 2007).

An independent board can also fail to implement the effective oversight because some of its members lack sufficient time. This aspect is shown in the observation result for Item 3 (Table III) that the average disclosure related to the selection process for board members is low (LOB). A low time commitment can result in ineffective information exchange between the boards and risk management function. Thus, board-level RGOV structures do not affect the performance of ASEAN-5 banks.

*4.2.3 Analysis of the effect of management-level risk governance structure on ROA.* The test results for *H3* (STRMGT) shows that the coefficient value is  $-0.006$  ( $p = 0.005$ ). This proves that the effect of RGOV at the management level on ROA is negative, although the magnitude of impact is very small (weak association). It is consistent with the findings of Andrię *et al.* (2018) that there is a higher bank burden and decreased cost efficiency when banks in Eastern Europe and Central Europe (emerging economies) have weak governance structures and risk management structures.

This study indicates that disclosure of responsibility, independence and competence regarding senior management, CRO, compliance and IA functions tends to decrease bank ROA in the ASEAN-5 countries, particularly in relation to higher operating expenses. Rigorous and rigid supervision by management tends to have lower levels of cost and technical efficiency. In other words, it is costly for banks to implement a strict RGOV structure, such as applying certain departments to maintain relations with investors (Verrecchia, 1983; Duarte *et al.*, 2008). In accordance with agency theory, conflicts of interest between principal and agent will generate agency costs, which include monitoring, bonding and residual loss. Such additional costs, which tend to decrease earnings, come from the compensation or remuneration expenses for the staff members at the management level who have capabilities in accordance with regulatory requirements. Banks with a higher risk level will configure a risk management function which is expected to ensure their risks will be lower. However, this system may increase their expense; for example, employing CROs with relatively larger salaries compared to CEOs may not necessarily guarantee lower risk levels (James, 2008).

*4.2.4 Analysis of the effect of risk management practices on ROA.* The testing result of *H4* shows there is no effect of risk management practice (PRACTRM) on the bank profit (coefficient value is  $-0.001$  at  $p = 0.798$ ). It means that risk management practices such as integrated governance, CRO reports, regular meetings and important risk management functions and risk-based compensation do not affect bank's ROA. This finding is consistent with previous studies (Pagach and Warr, 2007; Minton *et al.*, 2014), but it contradicts with the study of Erin *et al.* (2018) which proves that the implementation of enterprise risk management is negatively related to ROA.

Risk management practices do not affect ASEAN-5 banks' earnings because they are often unable to cope with risk, which might occur because of, for example, limitations in risk measurement technology that may not be applicable to all types of banks. Risk management practices might also be influenced by a behavioral bias or corporate culture. Risk management practices in the form of compensation, which are expected to encourage the

CEO to avoid potential risks to long-term profit declines, cannot be proven effective. Fundamentally, managers also prefer riskier projects because of the potential for higher returns that will ultimately increase their compensation.

*4.2.5 Analysis of the effect of control variables on ROA.* This study uses several control variables, namely, bank size (lnSIZE), CAR, the country's legal system (LAW) and economy growth (lnGDP). As shown in Table VI, bank size has a significant and positive effect on bank performance. Thus, the greater are the bank's total assets, the higher is the value of ROA. This finding is consistent with the study of Bikker and Hu (2002) that larger banks have more capability in funding their operations and investments or channeling funds (taking into account the debtor's ability to pay). Such activities have the potential to increase competitiveness and operating revenues, and thus have an impact on corporate profits. Large banks also benefit from economies of scale and economies of scope that operate with most of the non-interest income, higher leverage and extensively use wholesale funding. These benefits can encourage greater revenue and profits (Beccalli *et al.*, 2015).

CAR also has a significant and positive effect on ROA. This finding suggests that banks with a higher CAR value are more able to finance operational activities, maintain sufficient capital to cover risks and expand credit, activities that increase their potential profitability (ROA). This study also finds no difference in the effect of the legal system (common law vs code law) on ROA. Furthermore, GDP has a significant and positive effect on ROA. Consistent with the findings of Madura (2015), Ongore and Kusa (2013) and Barakat and Hussainey (2013) showed that GDP has the potential to increase demand and credit quality, and it has a positive effect on bank profitability. High GDP can also increase individual income, expenditure and business credit so that it will have an impact on increasing bank profitability.

#### *4.3 Sensitivity and additional analysis of the main research models*

This study re-estimated all the models by removing Singaporean banking observations during 2010–2014. Stock market growth, real GDP per capita and high total assets factors are likely to affect the results mainly related to the estimation of corporate's profitability (Claessens and Laeven, 2004). The OLS regression results were also used to know the potential endogeneity. To further illustrate how a spurious effect could arise if there is a dynamic relationship between past performance and current governance, consider a simple model in which past performance ( $ROA_{t-1}$ ) causes changes in current RGOV practices, which means that the OLS estimates would be biased if the past performance affects the current values of RGOV practices. We find the results remain unchanged qualitatively (not reported in the table for reasons of space). Finally, we also performed additional testing to investigate the possibility of a time lag. In general, the estimation results show a higher adjusted  $R^2$  and significant negative effect of current RGOV practices on ROA in the following year. Consistent with previous findings (Schmit and Roth, 1990; Adams and Mehran, 2012; Barakat and Hussainey, 2013; Erin *et al.*, 2018), the strict RGOV practices (for which risk committees and risk management units serve as proxies) are costly in accordance with the concept of coordination costs, communication problems with board committees, and expertise burdens. This concept reduces the performance or profitability in the following year.

### **5. Conclusions, implications, limitations and future research**

This study intended to examine the disparity between the disclosure of RGOV structures at both the board and management levels as well as the disclosure of risk management practices. The study also aimed to investigate the impact of these three RGOV practices on ASEAN-5 bank's performance as measured by ROA. Accordingly, indexes were constructed to explain RGOV practices in line with the governance guidelines issued by the Basel Committee in 2015. The study found ASEAN-5 banks have implemented procedures in



accordance with the Basel Committee's guidelines, although these guidelines were only issued in 2015. The level of bank RGOV practice disclosure in the regions also demonstrates a sufficient level and uptrend in the disclosure level during the period of 2010–2014.

Further test results showed that there is no impact of board-level RGOV structures and risk management practices on bank performance. However, there is the negative effect of management-level RGOV structure on profitability is in relative contrast to the expectations of the Basel Committee. Therefore, the implication of these findings is the banking regulators need to take into account the obligations regarding the implementation of necessary RGOV, particularly for small-sized banks. Banks and financial institutions also need to consider the possibility of paying high-level compensation and remuneration to senior managers. Thus, the existence of risk management and compliance functions can result in a slight increase in operational costs and decrease bank profits. Finally, the sensitivity test result shows the same result as the main test, demonstrating the robustness of the results.

However, the developed RGOV indexes based on 12 of the 13 governance guidelines published by the Basel Committee have several limitations. First, these RGOV indexes are measured solely based on the researchers' ability to probe measurements or criteria that have never been tested before. Second, it concerns the completeness of information. This study relies on publicly available annual reports (2010–2014) without including additional information beyond that contained in a bank's annual report. The third limitation is related to subjectivity and interpretation. This study uses a qualitative approach that involves an assessment of the extent to which a company has made disclosures without confirmed accuracy and completeness. Therefore, future research may conduct scoring supported direct interviews with respective bank respondents.

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Independent variable	Prediction	Dependent variable			
		RGOV	STRBOARD	STRMGT	PRACTRM
ROA	+	-0.232	-0.872**	-0.140	-1.503***
lnSIZE	+	1.028***	1.007***	1.061***	1.042***
CAR	+/-	-0.083	0.061*	0.023	-0.502**
LAW	+	0.004	-0.025**	0.097***	-0.059***
lnGDP	+	1.099***	1.191***	0.973	1.161***
<i>n</i>		285	285	285	285
Adjusted $R^2$		0.426	0.816	0.501	0.388
<i>F</i> -stat		43.24***	312.08***	58.08***	36.98***

**Notes:** ROA, return on assets, is level of bank performance in managing company's assets. RGOV is an effective risk governance practice, including 17 criteria or items of risk governance practices constructed from guidelines of risk governance issued by BCBS (2015). STRBOARD is a board-level risk governance structure, including the responsibilities, independence and competence of the board; selection process of board member and all committees candidate (audit, risk and compensation). STRMGT is a management-level risk governance structure that includes the roles of senior management, as well as tasks and independence of the CRO, compliance and internal audit functions. PRACTRM is a risk management practice including the group structure, CRO reporting, reporting process from the risk management function to the board and senior management, important and routine risk information and risk-based performance. lnSIZE is a bank size or a natural logarithm of total assets. CAR is a capital adequacy ratio. LAW is a dummy variable of the legal system of each country. lnGDP is a natural logarithm of the real gross domestic product per capita. \*, \*\*, \*\*\* Significant at the 10, 5 and 1 percent of levels, respectively.

**Table A1.**  
Regression estimation  
results of  
endogeneity testing

Independent variable	Prediction	Coefficient (1)	Dependent variable: ROA		
			Prob <i>t</i> -stat.	Coefficient (2)	Prob <i>t</i> -stat.
RGOV (-1)	H1: +	-0.005	0.033**		
STRBOARD (-1)	H2: +			0.007	0.001***
STRMGT	H3: +			-0.004	0.003***
PRACTRM (-1)	H4: +			-0.007	0.001***
lnSIZE	+	1.005	0.000***	1.007	0.000***
CAR	+/-	0.037	0.000***	0.050	0.000***
LAW	+	-0.001	0.097*	0.001	0.681
lnGDP	+/-	0.991	0.000***	0.989	0.000***
<i>n</i>		238		238	
Adjusted $R^2$		0.682		0.554	
<i>F</i> -stat		98.41	0.000***	41.250	0.000***

**Notes:** ROA, return on assets, is level of bank performance in managing company's assets. RGOV is an effective risk governance practice, including 17 criteria or items of risk governance practices constructed from guidelines of risk governance issued by BCBS (2015). STRBOARD is a board-level risk governance structure, including the responsibilities, independence and competence of the board; selection process of board member and all committees candidate (audit, risk and compensation). STRMGT is a management-level risk governance structure that includes the roles of senior management, as well as tasks and independence of the CRO, compliance and internal audit functions. PRACTRM is a risk management practice including the group structure, CRO reporting, reporting process from the risk management function to the board and senior management, important and routine risk information and risk-based performance. lnSIZE is a bank size or a natural logarithm of total assets. CAR is a capital adequacy ratio. LAW is a dummy variable of the legal system of each country. lnGDP is a natural logarithm of the real gross domestic product per capita. \*, \*\*, \*\*\* Significant at the 10, 5 and 1 percent of levels, respectively.

**Table A11.**  
Regression estimation  
results of lag testing

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